

Why would I need a Backflow Device?

If there exists an actual or potential health hazard or contamination risk to the public water system.

If the complexity of any existing and/or proposed water piping system creates a high probability of occurrence of cross-connections within a property owner' system.

If a residence, building, or facility has devices or plumbing fixtures that are required by state law to have a state approved backflow prevention assembly at the fixture and/or at the water meter.

If there is storage and handling of material dangerous to health or toxic substances which, if introduced into the water system, would constitute a system, plumbing, or health hazard.

Commercial and Residential applications

Air conditioning system	Fume hoods (lab)
Air washer	Garbage can washers
Aquarium make-up water	Heat exchangers (other than double wall with leak path)
Aspirator, chemical (Herbicide, Pesticide)	Heat pumps
Aspirator, Medical/lab	High pressure washers
Autoclave	Hot tubs (with direct connection)
Autopsy table	Hot water heating boilers
Baptismal fountain	Hydrotherapy baths
Bathtub, below rim filler	Ice makers
Bedpan washer	Industrial fluid systems
Beverage dispenser (post-mix Co2)	Irrigation systems (with or without chemicals)
Boiler tied into water system	Laboratory equipment
Bottle washing equipment	Laundry machines (commercial)
Box hydrant (irrigation)	Livestock drinking tanks
Carwash	Makeup tanks
Chemical feed tank for industrial process	Photo developing sinks / tanks
Chemical, Soap dispensers	Prime pump lines
Computer cooling lines	Chlorinators
Condensate tanks	Radiant heat system (with chemicals)
Cooling tanks	Radiator flushing equipment
Cooling towers	Recreational vehicle sewage pump
Decorative ponds	Sinks, below rim filler
Degreasing equipment	Sinks (with threaded spout)
Dental equipment / cuspidors	Solar water heating system
Dialysis equipment	Spas, Hot tubs
Dye vats and tanks	Steam generating equipment
Etching tanks	Stills
Fermenting tanks	Swimming pools (with direct connection)
Fertilizer injection	Trap primers
Film processors	Used, reclaimed or gray water systems
Fire Department pumper connections	x-ray equipment (non digital)
Fire system (with booster pumps)	
Fire system (with or without chemicals)	

Backflow Installation Applications letter Available

If any of the above apply, an installation approval letter is required. Blank forms are available at the Inspectors Office, DPS facility or online at www.peabody-ma.gov under Cross Connection Program.

Chapter 10 - Plumbing Code

Notes

Device, Assembly, or Method ¹	Degree of Hazard				Installation ^{2,3}
	Pollution (Low Hazard)		Contamination (High Hazard)		
	Back-Siphonage	Back-Pressure	Back-Siphonage	Back-Pressure	
Airgap	x		x		See Table 6-3 in this chapter.
Atmospheric Vacuum Breaker	x		x		Upright position. No valve downstream. Minimum of six (6) inches (152 mm) or listed distance above all downstream piping and flood-level rim of receptor. ⁴
Spill-Resistant Pressure-Type Vacuum Breaker	x		x		Upright position. Minimum of six (6) inches (152 mm) or listed distance above all downstream piping and flood-level rim of receptor. ⁵
Double Check Valve Backflow Preventer	x	x			Horizontal, unless otherwise listed. Requires one (1) foot (305 mm) minimum clearance at bottom for maintenance. May need platform/ladder for test and repair. Does not discharge water.
Pressure Vacuum Breaker	x		x		Upright position. May have valves downstream. Minimum of twelve (12) inches (305 mm) above all downstream piping and flood-level rim of receptor. May discharge water.
Reduced Pressure Principle Backflow Preventer	x	x	x	x	Horizontal unless otherwise listed. Requires one (1) foot (305 mm) minimum clearance at bottom for maintenance. May need platform ladder for test and repair. May discharge water.

¹ See description of devices and assemblies in this chapter

² Installation in pit or vault requires previous approval by the Authority Having Jurisdiction

³ Refer to general and specific requirement for installation.

⁴ Not to be subjected to operating pressure for more than 12 hours in any 24-hour period

⁵ For deck-mounted and equipment-mounted vacuum breaker, see Section 603.4.15

The model plumbing codes also have specific-use applications for backflow preventers. Examples of these include:

- Irrigation sprinkler systems are considered high-hazard applications. If chemicals are used in the system, such as chemigation, an RP is required, as backpressure may be present. Otherwise, a vacuum breaker may be used if it is installed correctly.
- Fire-sprinkler systems can be considered a low- or high-hazard application. If the system is constructed with potable water pipe and no chemicals are used in the system, such as antifreeze or fire retardants, no backflow preventer is required. If the system is constructed using non-potable water pipe, such as black iron and no chemicals are used, a DCVA is the minimum protection. If any chemical is used in the sprinkler system, the assembly required is an RP.



TABLE 22-1

Types of Backflow Prevention Devices Required: Subject to the provisions of 310 CMR 22.22(10), Table 310 CMR 22-1 shall serve as the guide for the type of protection required.

AG - Air Gap
 RPBP - Reduced Pressure Backflow Preventer
 DCVA - Double Check Valve Assembly

AVB - Atmospheric Vacuum Breaker
 PVB - Pressure Vacuum Breaker
 BPIAV - Backflow Preventer with Intermediate Atmospheric Vent

Types of Hazard on Premises	Acceptable Types of Backflow Preventers						Comments*
	AG	RPBP	DCVA	AVB	PVB	BPIAV	
1. Sewage Treatment Plant	X	X					
2. Sewage Pumping Station	X	X					
3. Food Processing	X	X	X*				* If no health hazard exists
4. Laboratories	X	X	X*				* If no health hazard exists
5. Fixtures with hose threads on inlets	X	X	X	X			In addition to an air gap separation, all fixtures that have a threaded hose type connection shall at a minimum, be equipped with a AVB in accordance with 248 CMR 2.14
6. Hospitals, Mortuaries, Clinics	X	X					
7. Plating Facilities	X	X					
8. Irrigation Systems	X	X		X*	X**		Each case should be evaluated individually. * An AVB can be used if no back pressure is possible and no health hazard exists. ** Pressure Vacuum Breakers can be installed if back pressure is not possible
9. Systems or Equipment Using Radioactive Material	X	X					
10. Submerged Inlets	X	X		X*			* If no health hazard exists and no back pressure is possible
11. Dockside Facilities	X	X					
12. Valved outlets or fixtures with hose attachments	X	X		X*			Each case should be evaluated individually * If no health hazard exists and no back pressure is possible
13. Commercial Laundries and Dry Cleaners	X	X					
14. Commercial Dishwashing Machines	X	X		X*			* If no health hazard exists
15. High and Low Pressure Boilers	X	X*					* If chemicals are added
16. Low Pressure Heating Boilers						X	Residential and small commercial, having no chemicals added
17. Photo Processing Equipment	X	X					
18. Reservoirs – Cooling Tower Re-circulating Systems	X	X					
19. Fire Protection Systems: For cross connection control, fire protection systems may be classified on the basis of water source and arrangement of supplies as follows:							

19. Fire Protection Systems (continued)							
19.a. <u>Class 1</u> : Direct connection from public water system mains only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; all sprinkler drains discharge to atmosphere, dry wells, or other safe outlets. These systems may or may not have fire department connections. Refer to 310 CMR 22.22(9)(d)1.	X	X	X				A backflow prevention assembly does not have to be installed on existing fire protection systems installed prior to March 21, 1997, provided that the fire protection system is registered with the public water system, equipped with a UL listed alarm check valve that is properly maintained in accordance with NFPA 25 and has not undergone substantial modification defined within 310 CMR 22.22(9)(d)3. Alarm check maintenance records must be available for inspection by the Department, its designee or the public water system
19.b. <u>Class 2</u> : Same as Class 1 except that booster pumps may be installed in the connections from the street mains. These systems may or may not have fire department connections. Refer to 310 CMR 22.22(9)(a).	X	X	X				A backflow prevention assembly does not have to be installed on existing fire protection system installed prior to March 21, 1997, provided that the fire protection system is registered with the public water system and equipped with a UL listed alarm check valve that is properly maintained in accordance with NFPA 25. Alarm check maintenance records must be available for inspection by the Department, its designee or the public water system
19.c. <u>Class 3</u> : Direct connection from public water system mains, plus one or more of the following: elevated storage tanks; fire pumps taking suction from aboveground covered reservoirs, or tanks; and pressure tanks.	X	X*	X*				* RBPB or DCVA contingent on evaluation of auxiliary supply and on-site system in accordance with 310 CMR 22.22(9)(d)1.
19.d. <u>Class 4</u> : Directly supplied from public water system mains, similar to Class 1 and Class 2 with an auxiliary water supply dedicated to fire department use and available to the premises, such as a non-potable water source located within 1700 feet of the fire department connection, (FDC).	X	X*					* RBPB on evaluation of auxiliary supply and on-site system in accordance with 310 CMR 22.22(9)(d)1.
19.e. <u>Class 5</u> : Directly supplied from public water system mains, and interconnected with auxiliary supplies, such as pumps taking suction from reservoirs exposed to contamination, or rivers and ponds; driven wells; mills or other industrial water systems; or where antifreeze or other additives are used.	X*	X*					* RBPB or air gap contingent on evaluation of auxiliary supply and on-site system. Refer to 310 CMR 22.22(9)(d)1.
19.f. <u>Class 6</u> : Combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks.	X	X*			X	X	* RBPB contingent on evaluation of on-site water system Refer to 310 CMR 22.22 (9)(d)1.
19.g. Residential fire protection systems for one and two family detached dwellings and manufactured homes only. Fire protection systems in three family dwellings meeting NFPA 13D requirements as provided in 780 CMR, Chapter 9, are included in this section.	X	X	X				Non testable devices and flow through systems should be used whenever possible. Systems are typically designed and installed in accordance with NFPA 13D: "Installation of Sprinkler systems in One and Two Family Dwellings and manufactured homes." These systems are authorized to use food grade antifreeze with no additional requirements when potable piping (PB, CPVC, and copper tube) is employed. If non-grade antifreeze is utilized, the system may be classified as a class 5. If a fire department connection is used, the requirements for a class 1 or 2 apply.
19.h. Residential fire protection systems for other than those described in Table 22-1-19.g.	X	X	X				Fire protection system in this category shall comply with the requirements set forth in class 1 through 4 as appropriate.
20. Solar Energy Systems	X	X				X*	Residential and small commercial having no chemicals or only USP Glycenne added to water
21. Single Jacketed Heat Exchangers	X	X					Each case should be evaluated individually